

# RECP Best Practice Catalogue

*Elimination of reverse osmosis in the  
preparation of process water*

*Developed within the framework of MED TEST II*



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION



The SwitchMed Programme is  
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# Best Practice - Elimination of reverse osmosis in the preparation of process water

<b>SECTOR:</b>	<b>Food &amp; Beverage</b>
<b>SUBSECTOR:</b>	Bakery and farinaceous products
<b>PRODUCTS</b>	Couscous (fine and medium), short pasta (small pellets, Tlitli, elbows of different sizes, vermicelli, macaroni, bird tongue, snail).
<b>CATEGORY</b>	Process control or modification
<b>APPLICABILITY</b>	Utilities
<b>COMPANY SIZE</b>	147 employees



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## Description of the problem (Base scenario):

The company obtains drinking water by tanker truck. The water then undergoes a cationic resin softening treatment followed by reverse osmosis. The water thus treated is used in the manufacturing process of pasta and couscous. International practices show that the use of reverse osmosis water is not necessary, but softened water at a Total Hardness of 3 to 6 °f is sufficient for good product quality.

## Description of the Solution

The solution consists of eliminating the reverse osmosis stage of the water treatment process and directly using the softened water while ensuring the proper functioning of the softener.

Note: °f a French degree corresponds to the hardness of a solution containing 10 mg / l of CaCO<sub>3</sub>.



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## Economic Benefits

16% reduction in supplied water costs, or:

$$1,400 \text{ m}^3/\text{year} \times 2 \text{ €/m}^3 = 3,148 \text{ €}$$

Reduction in energy costs consumed by the reverse osmosis unit:

$$4,500 \text{ KWh/year} \times 0.03 \text{ €/KWh} = 137.115 \text{ €/year}$$

Cost savings on reverse osmosis unit maintenance: cost of a membrane change = 1,016 €/year

Cost savings in maintenance personnel (n.d.)

Total: 4,302 €/year

## Environmental Benefits

16% reduction in water consumed (by avoiding the discarded water from reverse osmosis), or:  $8,760 \text{ m}^3/\text{year} \times 0.16 = 1,400 \text{ m}^3/\text{year}$

Reduction in energy consumption from the reverse osmosis unit:  $\sim 0.5 \text{ KWh/m}^3$  of treated water, or  $8,760 \text{ m}^3/\text{year} \times 0.5 \text{ KWh/m}^3 \sim 4,500 \text{ KWh/year}$

Reduction in GHG emissions of  $4.5 \text{ MWh/year} \times 0.670 \text{ tons of CO}_2/\text{MWh} = 3 \text{ tons of CO}_2/\text{year}$

## Health and safety impact

Not relevant



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<b>Capital investments &amp; financial indicators</b>	Cost: No cost Return on investment : immediately
<b>Suppliers</b>	Not applicable
<b>Other aspects</b>	Impact on product quality is to be observed
<b>Implementation</b>	



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